ESRC regional spending

Where does ESRC funding go? The answer to this question has two aspects: an organisational one, describing the allocation across institutions, and a geographical one, which reflects the spatial positioning of, and relationships between, those institutions.

The distribution of this funding in the organisational sense has already been analysed in detail[1] but that analysis had a minimal geographical aspect. This analysis adds a sense of 'place' into the picture.

If you have any questions or comments about this analysis please contact the head of ESRC's Insights team, alex.hulkes@esrc.ac.uk, or telephone 01793 413039.

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[1] http://www.esrc.ac.uk/files/about-us/performance-information/esrc-analysis-2017/ (PDF)

Key findings

- The great majority of ESRC funding is awarded to UK Higher Education Institutions
- HEI accessibility varies markedly across the UK but in general HEI density tracks UK population density closely
- ESRC research funding tends to match the distribution of UK HEIs (and by extension the UK population) but is slightly more concentrated
- Regional variations in the accessibility of ESRC research and training resources are small but noticeable
- There is no meaningful regional success rate variation

The organisational view

To distil the organisational view, a breakdown of our spending over the last six years shows the vast majority of it going to UK Higher Education Institutions (HEIs) which have degree awarding powers (or, as commonly understood, universities) as shown in Table 1:

Organisation type	% of spend
UK HEI	93.6
UK other[2]	4.6
Overseas[3]	1.8

Table 1: recipients of ESRC funding in financial years 2011-12 to 2016-17 by organisation type

And in this sense the answer to the question 'where does ESRC funding go?' is that most of it goes to UK universities. The ten universities receiving[4] the most funding from ESRC were:

University	ESRC spending (£M)
University of Essex	105
UCL	95
LSE	43
University of Oxford	39
University of Southampton	34
University of Edinburgh	33
The University of Manchester	32
University of Cambridge	21
University of Glasgow	20
Cardiff University	19

Table 2: top 10 recipients of ESRC funding in financial years 2011-12 to 2016-17
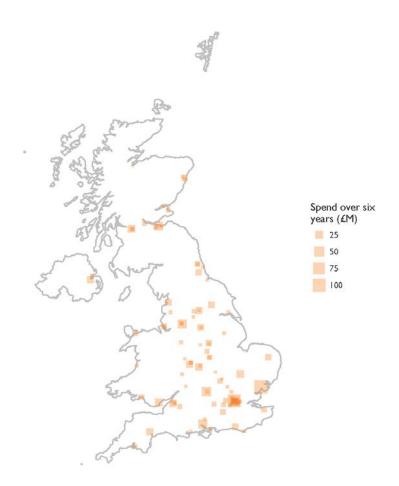
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[2] Of this half went to the Institute for Fiscal Studies and a fifth to the Institute of Development Studies.
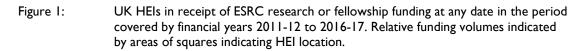[3] The largest single sum (just over £2 million) went to the University of Cape Town through a DfID poverty call.
[4] The distinction between the receipt of funding and its use is important. Some of the largest infrastructure grants distribute funding to other organisations or spend it in ways which are not comparable to a straightforward research grant. Receipt of funding is not a completely reliable indicator of volume of research.

The geographical view

Figure 1 shows the locations of each of the 108 UK HEIs that received ESRC funding at any time in the financial years 2011-12 to 2016-17, and an indication of the volume of funding that each received (extending Table 2 to include the complete set of HEIs):
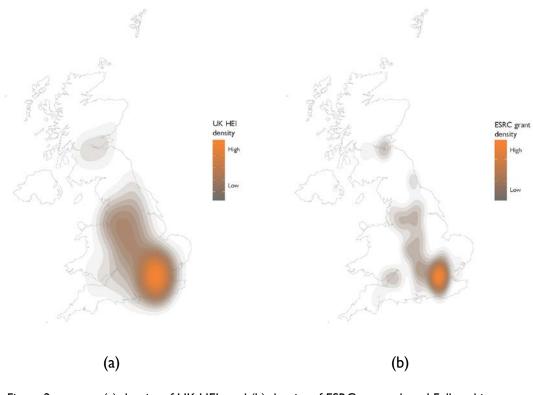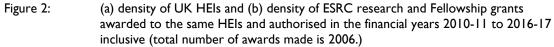

Figure 1:   UK HEIs in receipt of ESRC research or fellowship funding at any date in the period
            covered by financial years 2011-12 to 2016-17. Relative funding volumes indicated
            by areas of squares indicating HEI location.

Two thirds of the ~160 UK organisations in receipt of public funding via one of the UK funding councils[5] received some ESRC funding. Many of those that did not are small specialist institutions with little or no social science activity[6]. In general, where there are HEIs, there is ESRC funding.

As a result the distribution of ESRC grants tends to follows the distribution of UK HEIs, but not slavishly so. Figure 2 shows the density of UK HEIs alongside that of ESRC grants.

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[5] http://www.universitiesuk.ac.uk/facts-and-stats/Pages/higher-education-data.aspx
[6] Based on analysis of QR funding, around two thirds of HEIs which carry out at least some research in ESRC's remit receive at least some ESRC funding. The third of organisations which are active in social science but which do not receive ESRC funding account between them for less than 5% of UK social science spending.

(a)   (b)

Figure 2:   (a) density of UK HEIs and (b) density of ESRC research and Fellowship grants awarded to the same HEIs and authorised in the financial years 2010-11 to 2016-17 inclusive (total number of awards made is 2006.)

Thus proving to no great surprise that there's nowhere in the UK quite like London and the south east when it comes to research density.
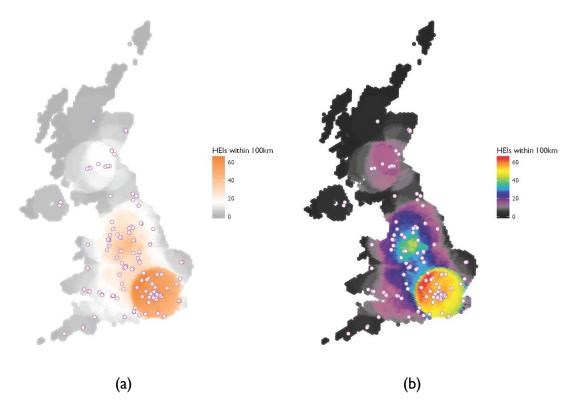
But density, which reflects the positioning of organisations and is the result of nearly 900 years of historical decision-making and circumstance, is not the same as research concentration or accessibility, which reflect resourcing decisions and which, in terms of 'place', matter more.
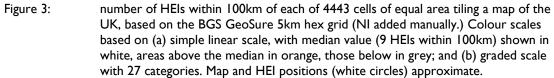
HEI accessibility

The twin issues of accessibility (including access to the knowledge and skills found in HEIs) and 'place' are recurrent themes in the UK's Industrial Strategy[7]. The implication is that proximity to resource matters:

> "The people best placed to drive forward local economies are those who live, work and do business in them", Industrial Strategy, p 220.

To be close to ESRC resources, you need to be close to HEIs. How geographically accessible or proximal are they? Are there any places which are particularly well- or poorly-serviced? Does the UK have university deserts or oases? Figure 3 suggests that, thinking purely in geographical terms, the answer is yes.

(a)   (b)

Figure 3:   number of HEIs within 100km of each of 4443 cells of equal area tiling a map of the UK, based on the BGS GeoSure 5km hex grid (NI added manually.) Colour scales based on (a) simple linear scale, with median value (9 HEIs within 100km) shown in white, areas above the median in orange, those below in grey; and (b) graded scale with 27 categories. Map and HEI positions (white circles) approximate.

A hot-spot of HEIs in the south east of England is very apparent in both representations, and the result of this is quite striking. If you stand anywhere within a circle 100 miles in diameter, centred on London and with Cambridge, Canterbury, Oxford and Sussex near its circumference, you will always be within 100km of at least 40 HEIs. The zone of greatest density fills an arc from Basingstoke to Bedford. Oxford sits at the middle of this arc and has the maximum value of 68 HEIs within 100km.
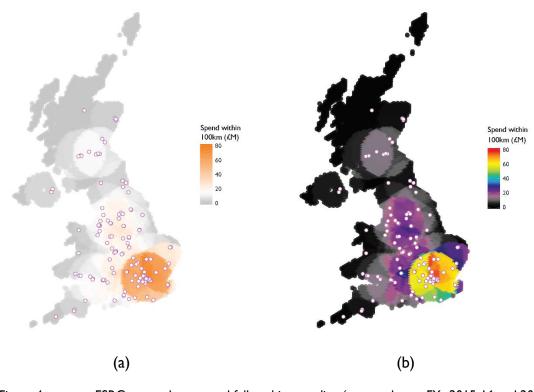
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[7] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/664563/industrial-strategy-white-paper-web-ready-version.pdf (PDF), for example on pages 62 and 84.
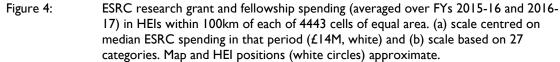
Beyond this south east circle, a broader area stretching north-north-west towards Lancaster and including the universities of Leeds, Liverpool, Manchester and Sheffield also has above-average HEI density. Outside that broader zone, the central belt of Scotland has only the UK-average number of HEIs within 100km[8]. Everywhere else HEI accessibility, by this simple measure, is below the median.

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[8] UHI is plotted as having only one location, in Inverness. In reality general availability of HEIs is slightly richer than that presented here as many HEIs have multiple campuses, only one of which is included here. But not all campuses will contain or enable access to all resources held by that HEI. Few would be interested in 'plain vanilla' access to an HEI as an idea (as simply being near an HEI is unlikely to have an effect all on its own) and so the more limited representation here is preferred to the maximally inclusive one.

ESRC funding accessibility

The distribution of ESRC research funding across the 160 HEIs which generate the pattern seen in Figure 3 is shown in Figure 4:

<div align="center">(a)</div> <div align="center">(b)</div>

Figure 4:   ESRC research grant and fellowship spending (averaged over FYs 2015-16 and 2016-17) in HEIs within 100km of each of 4443 cells of equal area. (a) scale centred on median ESRC spending in that period (£14M, white) and (b) scale based on 27 categories. Map and HEI positions (white circles) approximate.

The south-east circle identified in Figure 3 strongly determines the density of ESRC funding, which ranges between £80 million and zero annual ESRC spending within 100km of any point in the UK. In fact it seems that ESRC funding is even more concentrated than are the HEIs which might receive it (this was also suggested, but less obviously, in Figure 2.)

While there is still a zone of above-average ESRC spending extending northwards (and also westwards) from London, it is much less distinct. Scotland's ESRC funding density is uniformly at or below the median for the UK as a whole.

This still does not break the link between HEIs and ESRC resource, and so still does not answer the question of how the distribution of ESRC funding differs from what we might expect based on the placement of the UK's HEIs.

Figure 5 gives an impressionistic answer to this question, based on the difference between the ranks of each cell in the map according to their HEI proximity and ESRC funding.
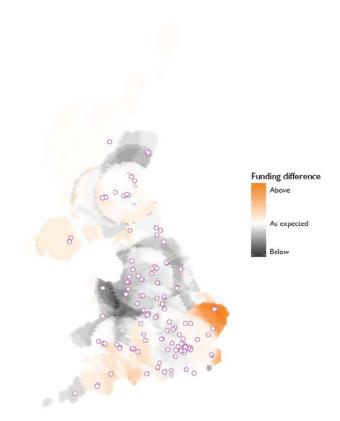
Figure 5: Difference in cell ranks of each of 4443 cells of equal area tiling a map of the UK. Cells ranked by ESRC research grant and fellowship spending (averaged over FYs 2015-16 and 2016-17) in HEIs within 100km of each cell, and number of HEIs within 100km of each cell. Map and HEI positions (white circles) approximate.
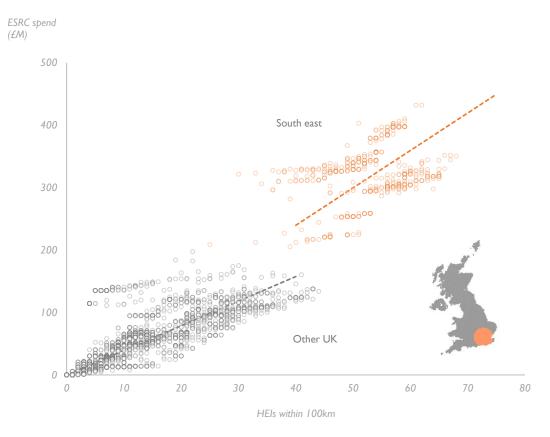
When the number of HEIs is taken into account, several hot- and cold-spots for ESRC funding reveal themselves.

The zone of high funding in East Anglia reveals one cause of the south east circle's existence: the large volume of funding awarded to Essex, which hosts a number of ESRC's strategic infrastructure investments[9]. The next most striking area of above-expected ESRC funding is the south west of England and south Wales.

Much of England and Wales north of Birmingham ranks lower in ESRC spending terms than the number of HEIs situated there might suggest. The central belt of Scotland appears to receive as much ESRC funding as would be expected, and Northern Ireland is perhaps slightly above expectations.

Figure 6 shows the relationship between ESRC spend and HEI density across the UK:

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[9] A substantial fraction of this funding is used to fund delivery of these, or is passed on to other HEIs, so in reality this apparent excess is much less meaningful than it might seem.

HEIs in the south east receive more ESRC funding on average than do those in other parts of the UK

Figure 6:   spend vs HEI density for the UK grid. Spend figure is total spend within 100km of each cell across financial years 2011-12 to 2016-17. Cells in the south east circle (see inset map) shown in orange.
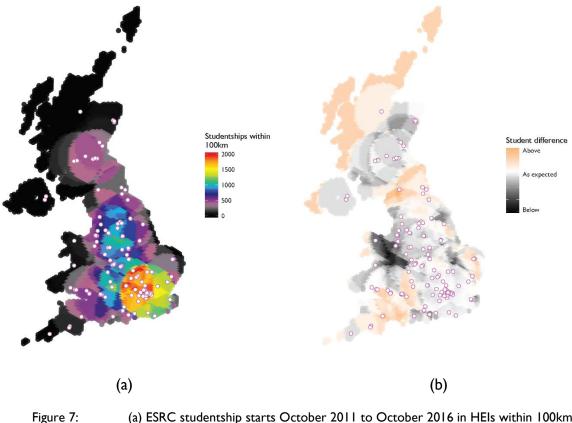
Within the south east circle, the level of spend rises more steeply with the number of HEIs than it does outside the circle, implying that on average HEIs in the south east receive more ESRC funding than do those not in the south east.

The distinction is quite stark. In the south east, each HEI adds on average £6 million to the six-year total of ESRC spending within 100km of a cell, while in the rest of the UK the figure is £4 million[10]. If all HEIs were the same size this would be odd. But they are not. Many of the most resource-intensive organisations are also the largest, and so it is not surprising that they receive the most resources.

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[10] The actual figures are entirely dependent on the distance chosen (100km in this case) so the absolute value should not be understood or used out of this context. A different scale would result in a different figure.

Studentship accessibility

As with research funding, the provision of ESRC students can also be viewed geographically. Figure 7 shows the number of ESRC DTC studentship starts within 100km of each point in the UK in the period October 2011 to October 2016[11].

(a)   (b)

Figure 7:   (a) ESRC studentship starts October 2011 to October 2016 in HEIs within 100km of each of 4443 cells of equal area tiling a map of the UK; (b) difference in cell ranking by studentships and HEI density. Map and HEI positions (white circles) approximate.
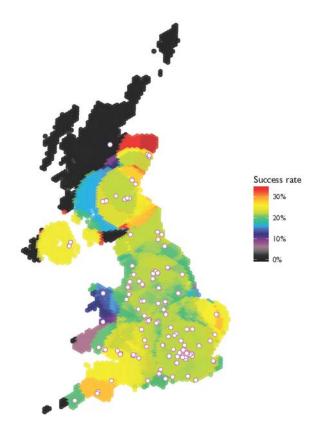
While the distribution of ESRC studentships matches that of HEIs more closely than does the distribution of ESRC research funding, the concentration in the south east is again obvious.

When it comes to hot and cold spots, again the south west of England and south Wales seem to do well, as this time does the far north of England. Scotland has fewer student starts than might be expected based on the number of HEIs it has, as do the north west of England and north Wales. The south east's provision is broadly speaking in line with expectations.

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[11] The DTCs have subsequently been superseded by DTPs, although organisational participation in the two mechanisms differs little. See http://www.esrc.ac.uk/skills-and-careers/studentships/doctoral-training-partnerships/. The DTCs attracted considerable support for additional studentships, so the distribution seen here represents a hybrid of ESRC funding decisions and those of other DTC partners.

Success rates

As Figure 8 shows, there is no meaningful regional variation in ESRC success rate across the UK:
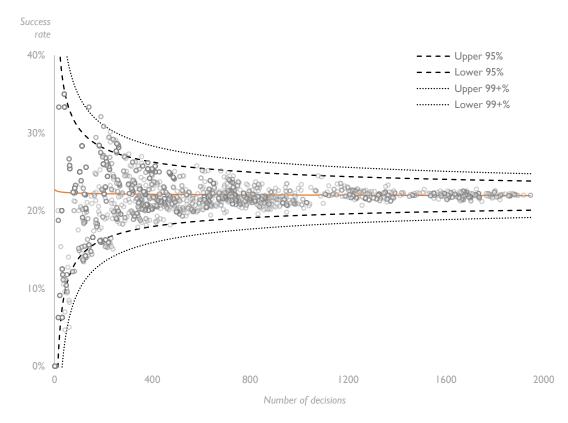

Figure 8: proportion of research grant applications funded within 100km of each of 4443 cells of equal area tiling a map of the UK, for decisions made in financial years 2014-15 to 2016-17. Grant data from http://www.esrc.ac.uk/files/about-us/performance-information/application-and-success-rate-data/; Map and HEI positions (white circles) approximate.

Across most of England and in the central belt of Scotland, success rates are remarkably uniform, and close to the average cell success rate of 22%.

While on the face of it there are some areas with success rates which are strangely high (for example the area north of Aberdeen, Breckland in East Anglia and the area around Plymouth) or low (the western fringe of Wales) these are all simply artefacts of noise associated with small decision volumes, as shown in Figure 9:

Across the UK, regional variation from the average ESRC success rate is not significant
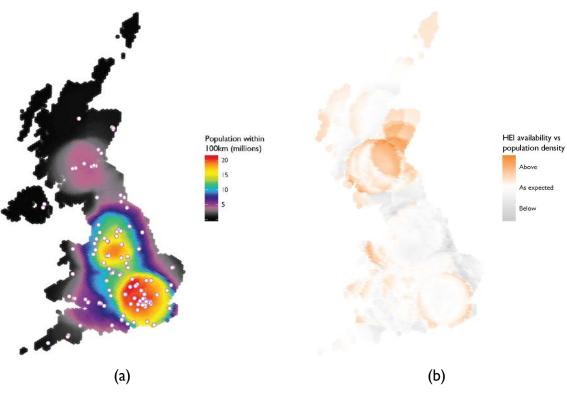

Figure 9:   funnel plot showing success rate by decision volume for cells in Figure 8. Predicted rate shown in orange.
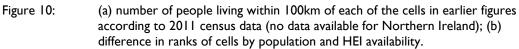
Variation from the average is exactly as expected given the decision volume associated with each cell[12], and there is no association between decision volume and success (as shown by the flat predicted line.) Cells which have larger decision volumes are no more or less likely to experience a positive outcome than are cells with smaller volumes, and no places in the UK have a particularly low or high ESRC success rate.

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[12] The relationship between volume and success is described here: http://www.esrc.ac.uk/files/about-us/performance-information/the-relationship-between-decision-volume-and-success-rates/ (PDF)

Spend per citizen

The UK's HEIs are where they are, and so broadly speaking so is ESRC spending. But is all this resource where the UK's population is? A mismatch between the two may indicate place-related challenges, but Figure 10 suggests that there is little to be concerned about.

Figure 10:   (a) number of people living within 100km of each of the cells in earlier figures according to 2011 census data (no data available for Northern Ireland); (b) difference in ranks of cells by population and HEI availability.

The UK population density as reported in the 2011 census (Figure 10a) is remarkably similar to the HEI density shown in Figure 3b. In general, and as 10b shows, the availability of UK HEIs matches the distribution of the UK population[13].

While some areas have access to HEIs at a level higher (Scotland) or lower (the east coast of England) than might be expected, in general most people in the UK live in an area as well served as any other area (or at least they did so in 2011.)

Figure 11 shows ESRC spend per head of population living within 100km of each HEI:

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[13] The correlation between rank by HEI and rank by population is very high ($\rho = 0.98$) meaning that almost all the variability in rank by HEI is associated with variability in rank by population. As the maps are not perfect representations of the UK, incorporating as they do aesthetic choices among others and lacking data on Northern Ireland completely, this figure should not be taken too literally.
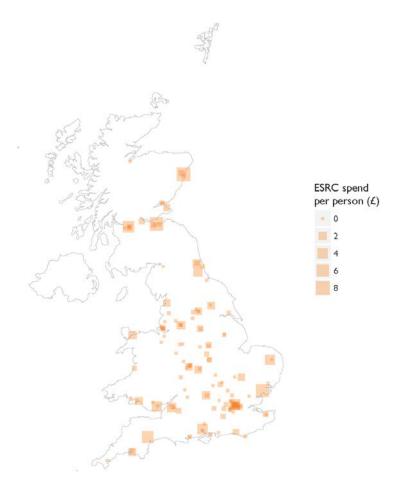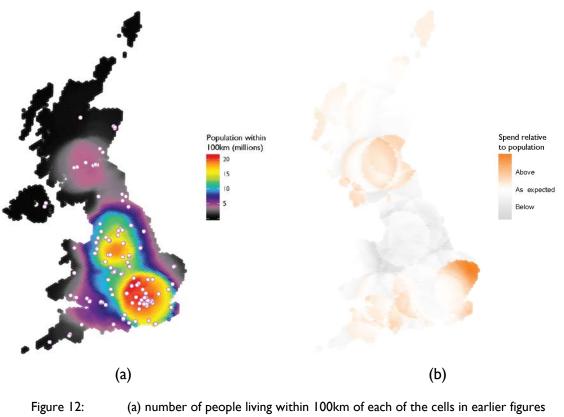
Figure 11:   Spend per person recorded in 2011 as living within 100km of UK HEIs in receipt of ESRC research or fellowship funding at any point in the period covered by financial years 2011-12 to 2016-17. Relative funding volumes indicated by areas of squares indicating HEI location. No data available for Northern Ireland.

The most striking pattern is the relatively large spend per head in coastal regions, which have lower potential populations simply because there is less dry land for people to live on.

As funding decisions are currently place-agnostic, coastal HEIs will tend to be more intense sources of funding. The regions around Aberdeen and Exeter benefit particularly, and in general Scotland has high levels of ESRC funding per head.

Oxford shows a reasonable level of funding per head despite being in the zone of greatest population density, but in this view the funding of the 'golden triangle' organisations tends not to stand out. In general those organisations seem to receive funding in proportion to the population that surrounds them. Figure 12 further supports this conclusion.

(a)	(b)

Figure 12:   (a) number of people living within 100km of each of the cells in earlier figures according to 2011 census data, no data available for Northern Ireland; (b) difference in ranks of cells by population and ESRC research and fellowship grant spending authorised in the financial years 2010-11 to 2016-17.

Again the Essex excess is apparent, as is the relative richness of ESRC spending in the south west of England and the central belt of Scotland.

The north of England and much of Wales has received less funding per person than might be expected. And again we see that the funding volume in the south east circle is unremarkable, more so when the Essex factor is removed.

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Summary

As almost all ESRC funding goes to UK universities, it is inevitable that the geographic distribution of our funding will track the geographic distribution of those universities. The pattern of ESRC resource allocation is relatively fixed and is determined to a great degree by centuries of history rather than current policy.

Significant changes in the placement of resource, if desired, could result only from significant changes in the processes by which those resources are allocated. Unless a sense of place is an explicit criterion for funding we will always see the same general pattern: close coupling of population, funding and HEI densities, with some outliers resulting from special cause variability.

But we should not be too fatalist about this, and we can ask an associated question: is the resource allocation unreasonable?

If by 'unreasonable' we mean in a way that doesn't reflect where the UK's citizens live then the answer is no. UK HEIs are found near people (or maybe people are found near HEIs?) and so is ESRC funding.

If we define unreasonable to include the idea of geographically-determined success rates the answer is also no. There are no lucky areas in the UK and nobody's ESRC proposal gets a boost simply because of the latitude and longitude of the person submitting it through Je-S. In the end though it is a fact that much of the ESRC's funding is concentrated in the south east. Is this a sign of unfairness or is it simply because that is where many of the HEIs are, and many of these HEIs happen to be, for whatever reasons, large ones?

An HEI's ESRC portfolio size is determined by the volume of applications it submits, the volume of funding requested in each application and the success rate for that HEI. Funding may be concentrated abnormally if at least one of these factors is abnormal and this abnormality is not counterbalanced by countervailing abnormality (or abnormalities) in the others.

This analysis rules out geographical variation in success rates as a cause of resource concentration. Variation in the distribution and density of funding that is not the direct result of geographic placement is likely to be driven by factors associated with institutions' sizes and resource appetites more than anything else.

Map data

The cell placements used to construct the representations of the UK used in Figure 3 onwards were derived from the BGS GeoSure 5km hex grid (http://www.bgs.ac.uk/products/geosure/geosureHex.html). Cells covering Northern Ireland were added manually by translating cells at the relevant latitudes in Scotland.

HEI locations were initially obtained from the HESA Unistats data set (https://www.hesa.ac.uk/support/tools-and-downloads/unistats). Several manual corrections were applied, and all locations checked, following online search. Some of the HEIs listed were removed, and some HEIs with multiple campuses were reduced to a single data point. This will tend to underplay the actual geographic accessibility of HEIs.
Analyses were carried out with R and/or Excel.

Census 2011 data were extracted from a range of sources. Those for England and Wales are based on reported MSOA centroids and populations. MSOA data for Scotland could not be found, so aggregated lower-level data with estimated centroids were used. As a result the centroids are less precise and, as with all analyses based on the grid, should be taken as indicative only. No relevant data for Northern Ireland could be found. The centroids used are shown to the right.

The choice of a 100km radius is arbitrary and will influence impressions and findings. For example, a plot similar to that in 10a but based on population within a 50km radius shows a noticeably patchier and more concentrated UK population: